Acceptance Decrease due to Orbit Bumps and Doglegs

$$A = \{\beta_{max} \times \varepsilon_N/\beta\gamma\}^{-1/2} + D_{max} \times \Delta p/p + C.O.D.$$

Good field region (horizontal): ± 1 inch (TM-405)

At injection (400 MeV):
   $\beta\gamma = 1.0$
   $\Delta p/p = \pm 0.13\%$ (measured)
   C.O.D.$= 2$ mm (optimal)

Without orbit bumps and doglegs:
   $\beta(x)_{max} = 33.7$ m, $D_{max} = 3.19$ m, $\beta(y)_{max} = 20.5$ m

   Max allowable beam emittance: $\varepsilon_N(x) = 11\ \pi$ mm-mrad

With orbit bumps and doglegs:
   $\beta(x)_{max} = 46.1$ m, $D_{max} = 6.13$ m, $\beta(y)_{max} = 27.0$ m

   Max allowable beam emittance: $\varepsilon_N(x) = 5.2\ \pi$ mm-mrad
   $\rightarrow$ a factor of 2 reduction due to large β and D!